

Take out proofs from yesterday.
I didn't scan the key.

2.7 Prove Angle Pair Relationships

Theorem 2.3--All right angles are congruent

Theorem 2.4-The Congruent Supplements Theorem--

If 2 \angle s are supplementary to the same \angle (or $\cong \angle$ s) then they are \cong .

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Theorem 2.5-The Congruent Complements Theorem--

If 2 \angle s are complementary to the same \angle (or $\cong \angle$ s) then they are \cong .

Prove Theorem 2.4

Given: $\angle 1$ and $\angle 2$ are supplementary

$\angle 3$ and $\angle 2$ are supplementary

Prove: $\angle 1 \cong \angle 3$

① $m\angle 1 + m\angle 2 = 180$	① Given
② $m\angle 3 + m\angle 2 = 180$	② def of suppl.
③ $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 2$	③ Subst.
④ $m\angle 2 = m\angle 2$	④ Reflexive
⑤ $m\angle 1 = m\angle 3$	⑤ Subtr.
⑥ $\angle 1 \cong \angle 3$	⑥ def of Congruence

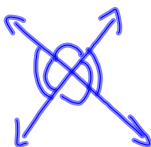
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Postulate 12—The Linear Pair Postulate (L.P.P)
If 2 \angle s form a Lin. Pair, then they are supplementary

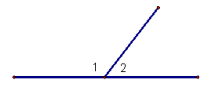
The Complement Theorem—If the noncommon sides of 2 adjacent angles form a right angle, then the angles are complementary angles. (not in book)

Theorem 2.6—Vertical angles are congruent



How they are used:

Given: picture



- | | |
|---|--------------------------------|
| 1. $\angle 1$ and $\angle 2$ are a linear pair. | 1. Definition of a linear pair |
| 2. $\angle 1$ and $\angle 2$ are supplementary | 2. The Linear Pair Postulate |
| 3. $m\angle 1 + m\angle 2 = 180$ | 3. Def. of supplementary |

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Given: $\angle 1 \cong \angle 3$

Prove: $\angle 2 \cong \angle 4$

Statements

Reasons

1. $\angle 1 \cong \angle 3$

② $\angle 1 + \angle 2$ are a L.P.
 $\angle 3 + \angle 4$ are a L.P.

③ $\angle 1 + \angle 2$ are suppl.
 $\angle 3 + \angle 4$ are suppl.

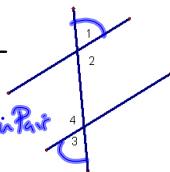
④ $\angle 2 \cong \angle 4$

1. Given

② def of Lin Pair

③ L.P.P.

④ \cong Suppl. thm



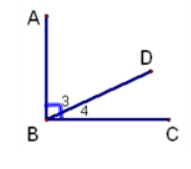
Given: $\overline{AB} \perp \overline{BC}$

1. $\angle ABC$ is a right angle

2. $\angle 3$ and $\angle 4$ are complementary

1. Def of \perp lines

2. The Complement Thm.



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Given: $\angle 1$ and $\angle 2$ are supplementary **Conclusion:** $m\angle 1 + m\angle 2 = 180$
Reason: Definition of supplementary angles

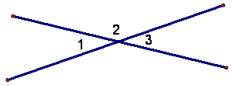
Given: $\angle 1$ and $\angle 2$ are complementary **Conclusion:** $m\angle 1 + m\angle 2 = 90$
Reason: Definition of complementary angles

Given: $\angle 1$ is a right angle **Conclusion:** $m\angle 1 = 90$
Reason: Definition of right angles

Given: $\overline{AB} \perp \overline{BC}$ **Conclusion:** $\angle ABC$ is a right angle
Reason: Definition of perpendicular lines

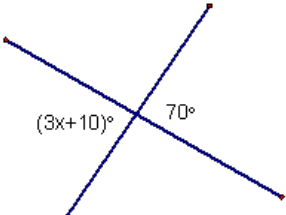
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Proof of theorem 2.6:
 Given: picture
 Prove: $\angle 1 \cong \angle 3$



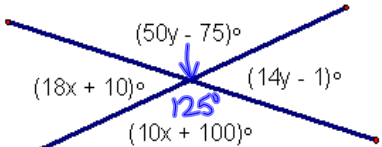
Statements	Reasons
① $\angle 1 + \angle 2$ are L.P. $\angle 2 + \angle 3$ are L.P.	① def of L.P.
② $\angle 1 + \angle 2$ are suppl. $\angle 2 + \angle 3$ are suppl.	② L.P.P.
③ $\angle 1 \cong \angle 3$	③ \cong Suppl. thm

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$3x + 10 = 70$
 $x = 20$

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$18x + 10 + 10x + 100 = 180$
 $28x = 70$
 $x = 2.5$

$y = 4$

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HW
p127-130
3, 4, 9, 11-14, 17-21, 28, 29, 38, 43

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